

CLAIMS

What is claimed is:

- 1 1. A method comprising:
2 determining which traffic class each received network packet belongs;
3 determining a path to be taken by each packet through a switch fabric;
4 classifying each packet into one of a plurality of flow bundles based on the
5 packet's destination and path through the switch fabric;
6 mapping each packet into one of a plurality of queues to await transmission
7 based on the flow bundle to which the packet has been classified; and
8 scheduling the packets in the queues for transmission to a next destination
9 through the switch fabric.
- 1 2. The method of claim 1, further comprising regulating the rate at which traffic
2 moves out of the queues with a traffic shaping algorithm.
- 1 3. The method of claim 1, wherein determining a path to be taken by each packet
2 through a switch fabric comprises determining a path to be taken by each packet
3 through a switch fabric based on load balancing.
- 1 4. The method of claim 1, further comprising labeling each packet with
2 information identifying an associated flow and flow bundle.
- 1 5. The method of claim 1, wherein classifying each packet into one of a plurality
2 of flow bundles comprises classifying each packet into one of a plurality of flow

3 bundles based on the packet's destination, path through the switch fabric, and
4 priority.

1 6. The method of claim 1, wherein scheduling the packets in the queues for
2 transmission comprises scheduling the packets in the queues for transmission using
3 a Round Robin scheduling algorithm.

1 7. The method of claim 1, wherein scheduling the packets in the queues for
2 transmission comprises scheduling the packets in the queues for transmission using
3 a Longest Delay First algorithm.

1 8. The method of claim 1, wherein scheduling the packets in the queues for
2 transmission comprises scheduling the packets in the queues for transmission using
3 a Stepwise QoS Scheduler (SQS).

1 9. The method of claim 1, wherein determining which traffic class each received
2 network packet belongs comprises determining which traffic class each received
3 network packet belongs based on protocols associated with the packet.

1 10. The method of claim 1, further comprising forwarding the packets to a switch
2 coupled to the switch fabric for transmission to the next destination.

1 11. An apparatus comprising:
2 a classification unit to examine packets received from a network, determine a
3 path to be taken by each packet through a switch fabric, and classify each packet into
4 one of a plurality of flow bundles based on the packet's destination and path through
5 the switch fabric;

6 a mapping unit coupled to the classification unit to place each packet into one
7 of a plurality of queues based on the flow bundle to which the packet has been
8 classified;
9 one or more traffic shapers coupled to the mapping unit to regulate the rate at
10 which traffic moves out of the queues; and
11 a scheduler coupled to the traffic shapers to regulate the order in which
12 packets in the queues will be transmitted to a next destination through the switch
13 fabric.

1 12. The apparatus of claim 11, further comprising an access unit coupled to the
2 classification unit to receive packets from and transmit packets to the network.

1 13. The apparatus of claim 11, further comprising a switch coupled to the
2 scheduler to transmit the scheduled packets to the switch fabric.

1 14. The apparatus of claim 11, wherein the classification unit comprises a load
2 balancing element to determine a path to be taken by each packet through a switch
3 fabric based on load balancing.

1 15. The apparatus of claim 11, wherein the classification unit comprises a labeling
2 element to label each packet with information identifying an associated flow and flow
3 bundle.

1 16. An article of manufacture comprising:
2 a machine accessible medium including content that when accessed by a
3 machine causes the machine to:

4 determine a path to be taken by each received network packet through a
5 switch fabric;
6 classify each packet into one of a plurality of flow bundles based on the
7 packet's destination and path through the switch fabric;
8 map each packet into one of a plurality of queues to await transmission
9 based on the flow bundle to which the packet has been classified; and
10 schedule the packets in the queues for transmission to a next destination
11 through the switch fabric.

1 17. The article of manufacture of claim 16, wherein the machine-accessible
2 medium further includes content that causes the machine to regulate the rate at
3 which traffic moves out of the queues using a traffic shaping algorithm.

1 18. The article of manufacture of claim 16, wherein the machine-accessible
2 medium further includes content that causes the machine to label each packet with
3 information identifying an associated flow and flow bundle.

1 19. The article of manufacture of claim 16, wherein the machine-accessible
2 medium further includes content that causes the machine to determine which traffic
3 class each received network packet belongs.

1 20. The article of manufacture of claim 16, wherein the machine accessible
2 medium including content that when accessed by the machine causes the machine to
3 determine a path to be taken by each received network packet through a switch fabric
4 comprises machine accessible medium including content that when accessed by the
5 machine causes the machine to determine a path to be taken by each received
6 network packet through a switch fabric based on load balancing.

1 21. The article of manufacture of claim 16, wherein the machine accessible
2 medium including content that when accessed by the machine causes the machine to
3 classify each packet into one of a plurality of flow bundles comprises machine
4 accessible medium including content that when accessed by the machine causes the
5 machine to classify each packet into one of a plurality of flow bundles based on the
6 packet's destination, path through the switch fabric, and priority.

1 22. The article of manufacture of claim 16, wherein the machine-accessible
2 medium further includes content that causes the machine to forward the packets to a
3 switch coupled to the switch fabric for transmission to the next destination.

1 23. A system comprising:
2 a switch to receive and transmit packets;
3 a classification unit to examine packets received from a network through the
4 switch, determine a path to be taken by each packet through a switch fabric, and
5 classify each packet into one of a plurality of flow bundles based on the packet's
6 destination and path through the switch fabric;
7 a mapping unit coupled to the classification unit to place each packet into one
8 of a plurality of queues based on the flow bundle to which the packet has been
9 classified;
10 a scheduler coupled to the mapping unit to regulate the order in which packets
11 in the queues will be transmitted to a next destination; and
12 a switch fabric coupled to the switch via which scheduled packets are
13 transmitted to the next destination.

1 24. The system of claim 23, further comprising one or more traffic shapers coupled
2 to the scheduler to regulate the rate at which traffic moves out of the queues.

1 25. The system of claim 23, wherein the classification unit comprises a load
2 balancing element to determine a path to be taken by each packet through the switch
3 fabric based on load balancing.

1 26. The system of claim 23, wherein the classification unit comprises a labeling
2 element to label each packet with information identifying an associated flow and flow
3 bundle.